

# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN OR RELATING TO SUCTION TAKE-OFF ATTACHMENTS

(71) I, WILLIAM GUY ROWLAND, a British subject of Quinceborough Farm, Widemouth Bay Road, Widemouth Bay, Bude, Cornwall, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to suction take-off attachments and is concerned with attachments by which the suction effect of internal combustion engines may be utilised to operate suction-utilising milking machines.

According to one aspect of the present invention, there is provided a suction take-off attachment for connecting the air intake of an internal combustion engine to a suction-utilising milking machine, the said attachment having a body provided with an air passage connectible through openings to said air intake and said machine and an air inlet of variable size opening into said passage between said openings.

According to another aspect of the present invention, there is provided a combination of an internal combustion engine, a suction-utilising milking machine and a suction take-off attachment connected between the air intake of said engine and the suction-utilising milking machine, the attachment including an air inlet of variable size.

As an example of the use of an attachment in accordance with said one aspect of the invention, a vacuum-operated milking machine may be driven by an agricultural tractor, by connection of the vacuum tank of the milking machine to the air intake of the tractor engine through the intermediary of the attachment.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:—

Figure 1 is a plan view of an attachment in accordance with the present invention,

Figure 2 is a sectional side view of the attachment of Figure 1,

Figure 3 is a side view of the attachment,

Figure 4 is an underneath plan view of the attachment, and

Figure 5 is a perspective view of a suction take-off attachment in accordance with the invention, in use.

Referring to Figures 1 to 4 of the drawings, the suction take-off attachment shown therein comprises a tapering connecting portion 1, a cylindrical connecting portion 2, and a frusto-conical central portion 3. The tapered connecting portion 1 is provided with external ridges 5 to grip a pipe into whose end the portion 1 is inserted. The cylindrical connecting portion 2 may also be tapered and ridged if desired.

The attachment is provided with an air passage 6 therethrough which extends from an opening 7 in the portion 1 to an opening 8 in the portion 2.

The central portion 3 is provided with two tapped bores 4 that both extend normal to the external face of the portion 3. Each bore 4 (of which there may be more than two) is intended to hold a corresponding valve in an adjustable manner. The air inlets that are thus formed are of conventional configuration and are adjustable to allow variation of their sizes and consequently of the rates of flow of air therethrough.

Referring to Figure 5, the suction take-off attachment that is illustrated therein has only one tapped bore 4 in which is located an air inlet valve 9. The portion 2 is secured within the end of an air intake 10 of an internal combustion engine. The portion 1 is secured by means of the ridges 5 within the end of flexible tube 11 which leads to the vacuum tank or suction reservoir of a suction-utilising milking machine.

The body of the attachment may be made in any convenient manner, such as by turning or casting from any convenient material such as metal or a synthetic plastics material. The connection between the portion 2 and the air intake 10 can be indirect, as by a conduit or tube, and similarly the connection between the portion 1 and the suction-utilising milking machine may be direct.

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The valve 9 is a metering or bleed screw, but it could be a simple by-pass jet controlled manually by a screw, or it may be an automatic valve controlled by a counteracting spring. Furthermore, the air inlet may incorporate any conventional adjusting means, provided on the valve body or at a point remote therefrom. The volume of air per unit time that is required to keep the internal combustion engine running may thus be controlled either manually, automatically or mechanically by varying the size of the air inlet and such adjustment also has the effect of controlling the suction produced by the engine and hence the vacuum produced at the suction-utilising milking machine. The air admitted to the attachment is thus derived from the aid inlet and/or from the suction-utilising machine.

One example of a use to which the described suction take-off attachment may be put is to enable a vacuum-operated milking machine to be run from the internal combustion engine of an agricultural tractor.

In such use, the attachment is connected between the engine and the machine as described with reference to Figure 5. The connections are all made as air-tight as possible in order to minimise or prevent air leakage into the system. It is advisable, in order to prevent danger to men and livestock, and to ensure efficient operation of the equipment, to make sure that adequate ventilation is provided for the exhaust and air intake of the internal combustion engine of the tractor.

With the attachment connected as aforesaid, the tractor engine is started up and set to run at a fast tick-over, for example at approximately 1100 r.p.m. The valve 9 of the air inlet is then adjusted until the correct vacuum reading is obtained in the vacuum tank of the milking machine, and until a minimum of smoke is emitted from the tractor engine exhaust. The vacuum reading is conveniently taken from the vacuum gauge generally provided on milking machine. The milking machine and/or the tractor engine can, of course, be stopped and started as desired, without disturbing the setting of the valve 9. Furthermore, the attachment may easily be removed and transferred to other equipment.

The suction take-off attachment of the invention employs air drawn through at least one air inlet of variable size and/or from the suction-utilising machine. With correct adjustment of the attachment, a vacuum reading of at least 15 inches of mercury can be obtained without harmful effects on the co-operating internal combustion engine.

#### WHAT I CLAIM IS:—

1. A suction take-off attachment for connecting the air intake of an internal combustion engine to a suction-utilising milking machine, the said attachment having a body provided with an air passage connectible through openings to said air intake and said machine and an air inlet of variable size opening into said passage between said openings.

2. An attachment as claimed in claim 1, comprising two axially aligned hollow connecting portions formed with said openings, the connecting portions being coupled together by a central portion through which is formed the air passage and the central portion being formed with a transverse bore having a valve adjustably located therein.

3. An attachment as claimed in claim 2, wherein at least one of the connecting portions is tapered and ridged to facilitate the connection thereof to a flexible pipe.

4. An attachment as claimed in any preceding claim, wherein the air inlet comprises a threaded bore in which is located a bleed screw.

5. A combination of an internal combustion engine, a suction-utilising milking machine and a suction take-off attachment connected between the aid intake of said engine and the suction-utilising milking machine, the attachment including an air inlet of variable size.

6. A combination as claimed in claim 5, wherein the internal combustion engine is part of an agricultural tractor.

7. A suction take-off attachment substantially as hereinbefore described with reference to the accompanying drawings.

8. A combination of an internal combustion engine, a suction-utilising milking machine and a suction take-off attachment, which attachment includes an air inlet of variable size, substantially as hereinbefore described.

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FIG.1

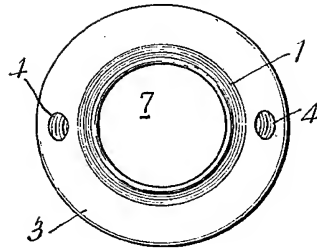


FIG.4

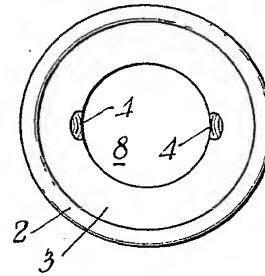


FIG.2

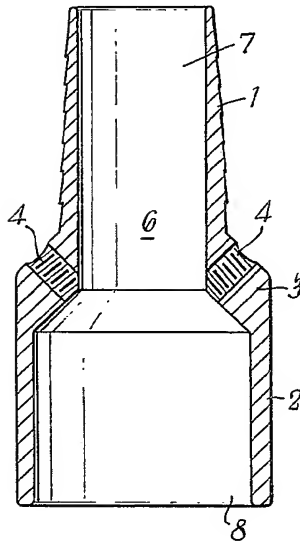
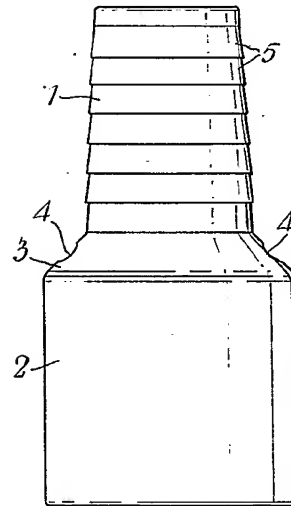


FIG.3



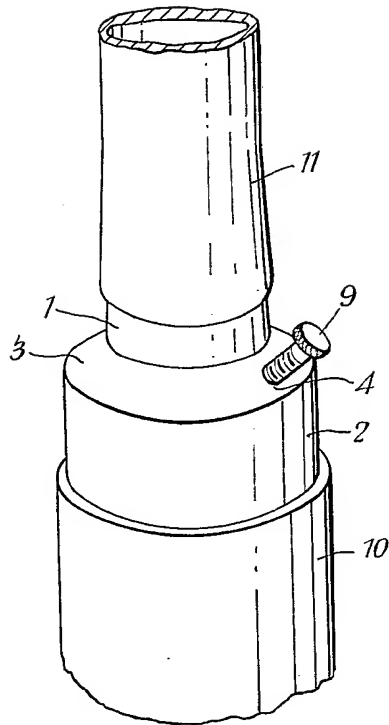


FIG. 5